Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1-13 (cancelled)

14. (currently amended) A position determining system that measures a position of an alignment mark on a substrate, comprising:

a superluminescent device (SLD) that transmits a light beam having a longitudinal coherence length based on at least one optical parameter associated with one or more optical elements of the position determining system, wherein the longitudinal coherence length substantially eliminates ghost or spurious reflections from the one or more optical elements present during exposure of a pattern in a lithography tool;

a lens system that directs the light beam to be diffracted from the alignment mark on a wafer, the diffracted light causing the ghost or spurious reflections through its interaction with the lens system;

~~a sensor~~ an interferometer configured to use the diffracted light to determine a position of the alignment mark to produce a control signal related to the determined position, wherein the interferometer is configured to determine the position of the alignment mark using an interference pattern; and

a positioning system configured to align the substrate to receive a subsequent pattern based on the control signal,

wherein the positioning system is configured to use the control signal to substantially reduce the ghost or spurious reflections during receipt of the subsequent pattern by the substrate.

15. (previously presented) The system of claim 14, wherein the SLD is configured to produce the longitudinal coherence length of the light beam that substantially eliminates interference between at least one of the ghost or spurious reflections caused by the lens system and the diffracted light beam.

16. (previously presented) The system of claim 14, wherein the SLD is configured to produce the longitudinal coherence length of the light beam that is less than a smallest distance between first and second ones of the lenses in the lens system.

17. (previously presented) The system of claim 14, wherein the SLD comprises a laser diode having an anti-reflection coating on at least one surface.

18. (canceled)

19. (previously presented) The system of claim 14, wherein the SLD is configured to produce the longitudinal coherence length of the light beam that is about 0.5 mm or less.

20. (previously presented) A position measuring method that measures a position of an alignment mark on a substrate, comprising:

determining a longitudinal coherence length for superluminescent light based on at least one optical parameter associated with one or more optical elements of a position determining system, wherein the longitudinal coherence length substantially eliminates ghost or spurious reflections from the one or more optical elements present during exposure of a pattern in a lithography tool;

generating and transmitting the superluminescent light having the longitudinal coherence length;

directing the superluminescent light to be diffracted from the alignment mark on a wafer using a lens system;

diffracting the superluminescent light from the alignment mark to produce +/- first order diffracted beams;

directing the +/- first order diffracted beams onto a combining element using the lens system, the diffracted light causing the ghost or spurious reflections through its interaction with the lens system;

combining the +/- first order diffracted beams using the combining element;

determining a position of the alignment mark based on an interference pattern generated from the combining step;

generating a control signal based on the determined position; and

positioning the substrate to properly align the substrate to receive a subsequent pattern based on the control signal,

wherein the control signal generated from positioning the substrate is used to substantially reduce the ghost or spurious reflections during receipt of the subsequent pattern by the substrate.

21. (previously presented) The method of claim 20, wherein the generating step comprises using a superluminescent device (SLD) to generate the superluminescent light.

22. (previously presented) The method of claim 20, wherein the generating step comprises using a laser diode having at least one anti-reflective surface to generate the superluminescent light.

23. (currently amended) The method of claim 20, wherein the longitudinal coherence length of the superluminescent light is about 0.5 mm or less.

24. (currently amended) The method of claim 20, wherein the longitudinal coherence length of the light beam is less than a smallest distance between first and second ones of the lenses in the lens system.

25. (currently amended) The method of claim 20, wherein the longitudinal coherence length of the light beam is less than a smallest thickness of one of the lenses in the lens system.

26. (currently amended) A system, comprising:

a superluminescent device (SLD) configured to transmit a light beam;

a lens system configured to direct the light beam to be diffracted from the alignment mark on a wafer, the diffracted light causing ghost or spurious reflections through its interaction with the lens system;

~~a sensor~~ an interferometer configured to use the diffracted light to determine a position of the alignment mark to produce a control signal related to the determined position, wherein the interferometer is configured to determine the position of the alignment mark using an interference pattern; and

a positioning system configured to align the substrate to receive a subsequent pattern based on the control signal,

wherein the positioning system is configured to use the control signal to substantially eliminate the ghost or spurious reflections during receipt of the subsequent pattern by the substrate.

27. (new) An interferometric measuring device, comprising:

a laser diode configured to generate a beam of radiation having a coherence length of about 0.1 to 0.5 mm and configured to direct the beam of radiation to reflect from a diffractive alignment target to form first and second beams that are out of phase with respect each other and that interfere with each other to form an interferogram, an interference pattern, or interference fringes; and

a sensor configured to receive the interferogram, the interference pattern, or the interference fringes and to generate an alignment signal therefrom,

wherein the beams of radiation being the about 0.1 to 0.5 mm provides for a substantial elimination of spurious or ghost reflections from optical elements within the system have widths greater than about 0.1 to 0.5 mm to reduce unwanted additional

beams, caused by the spurious or ghost reflections, from interfering with the interferogram, the interference pattern, or the interferometric fringes.